SS 2013 – Crystal bases and combinatorics

1. **Definition and motivation. What are quantum groups and why are they interesting?**
   Literature: Hong-Kong, Introduction to quantum groups and crystal bases, Introduction + Chapter 3
2. **Crystals bases for beginners**, Chapter 4 *Christian*
3. **Global bases**, Chapter 6
4. **Combinatorial model for crystals: Young tableaux**, Chapter 7+8
5. **Generalizing to symmetrizable Kac-Moody algebras: The path model** *Peter*
6. **Local properties of crystals**, Literature: Stembridge "A local characterization of simply-laced crystals", Danilov-Karzanov-Koshevoy "B_2 – crystals: axioms, structure, models"
7. **Perfect crystals and what is it all about KR-modules** *Ghislain*
8. **Geometric realization of crystals: Nakajima's quiver varieties** *Bea*
9. **Geometric realization of crystals: MV polytopes**, Literature: Kamnitzer "MV cycles and polytopes" *Jacintha*
10. **Combinatorial models: Benchmark**
11. **Crystal bases for Super Lie algebras: What are the problems, what is proven?**

The main guideline for the working group is a seminar at the MIT from spring 2011.
(http://math.mit.edu/~ptingley/QuantumGroupsSpring2011/)

If you have any further suggestions for further talks or doubting that one of the talks above is useful, please let me know. Also, if you are interested in giving a talk, do not hesitate, **first come first serve**.

Best, Ghislain